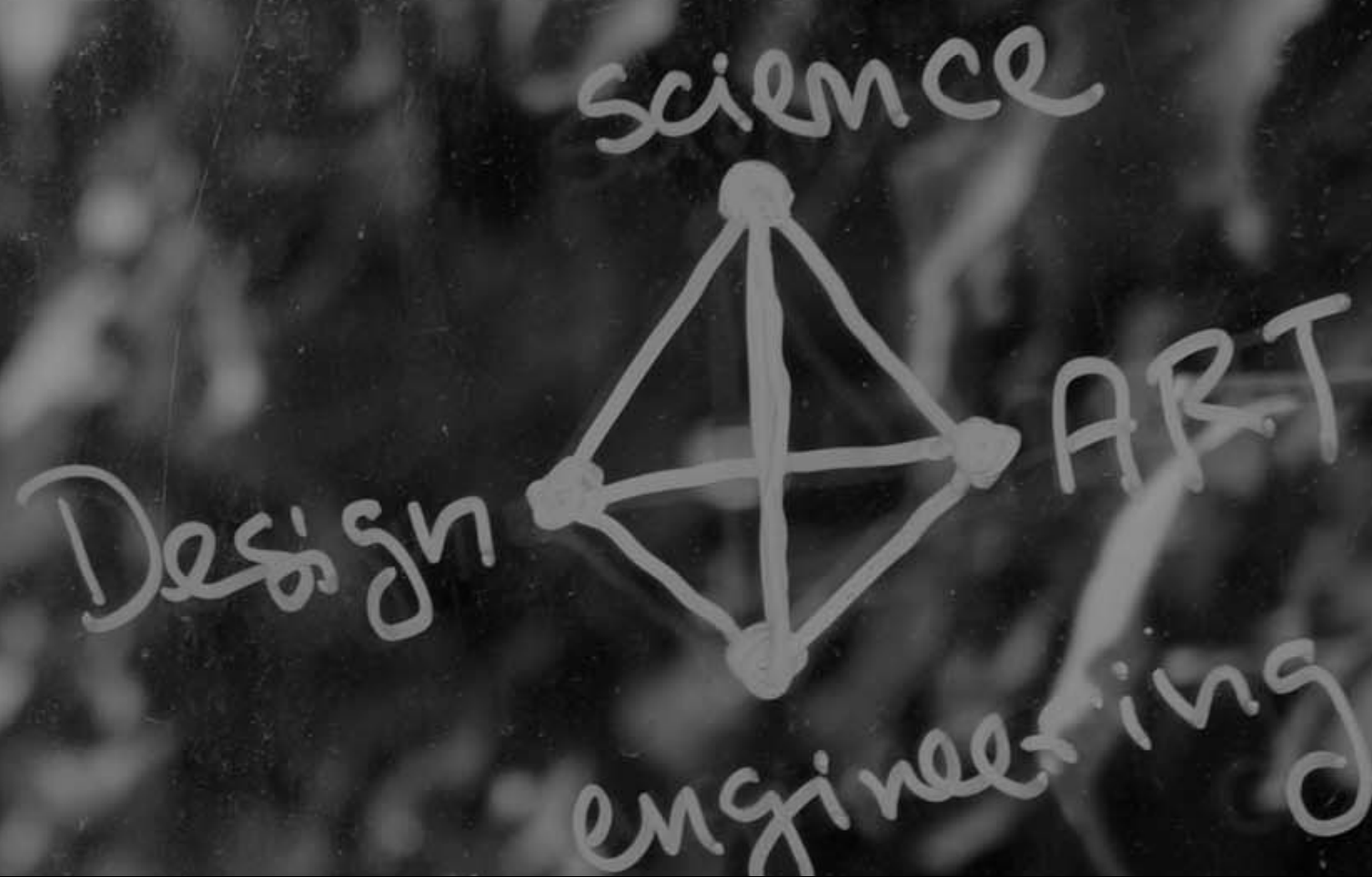


Best Practices for Mobile VR Development

Benjamin Nourse Miller
Lead Experience Designer
WemoLab
@noursemiller



GAME DEVELOPERS CONFERENCE[®] NEXT
FEATURING APP DEVELOPERS CONFERENCE[™]
LOS ANGELES CONVENTION CENTER · LOS ANGELES, CA
NOVEMBER 3-4, 2014



hello! i develop vr



some games i helped make





vr dev experience

early fan - developer - vr judge - obsessed



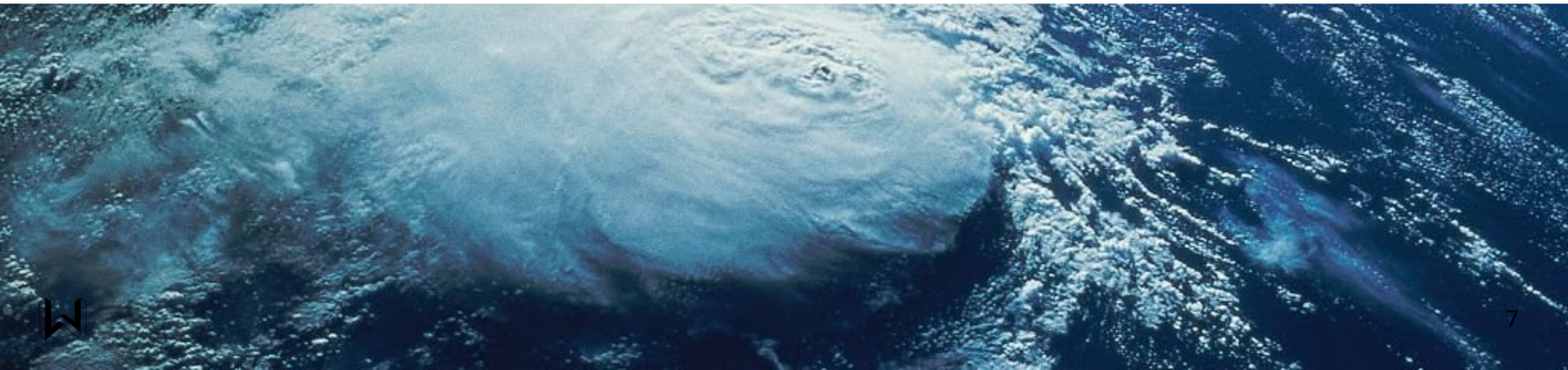






overview

context - enemies - key takeaways - Q&A





context







context:
focus on gen 0 & gen 1 VR



BRAVE NEW WORLD

takeaway 1

little is set in stone







context:

focus on AAA, Unity & Android

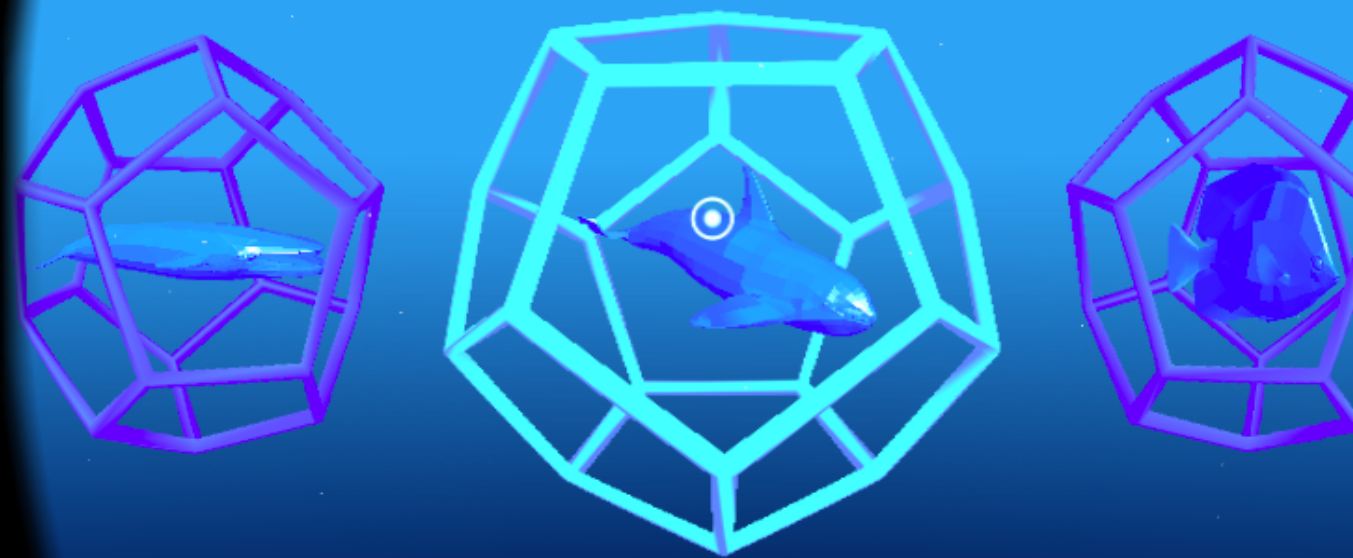


 **thebluVR**



arctic

 **thebluVR**



arctic



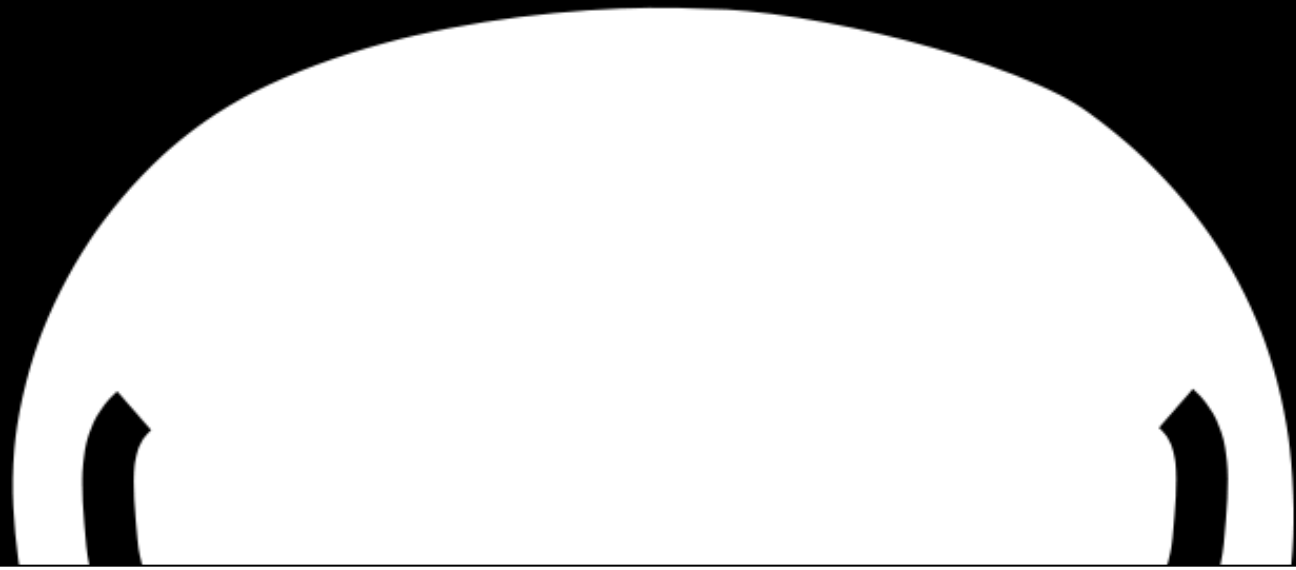


WEMOLAB

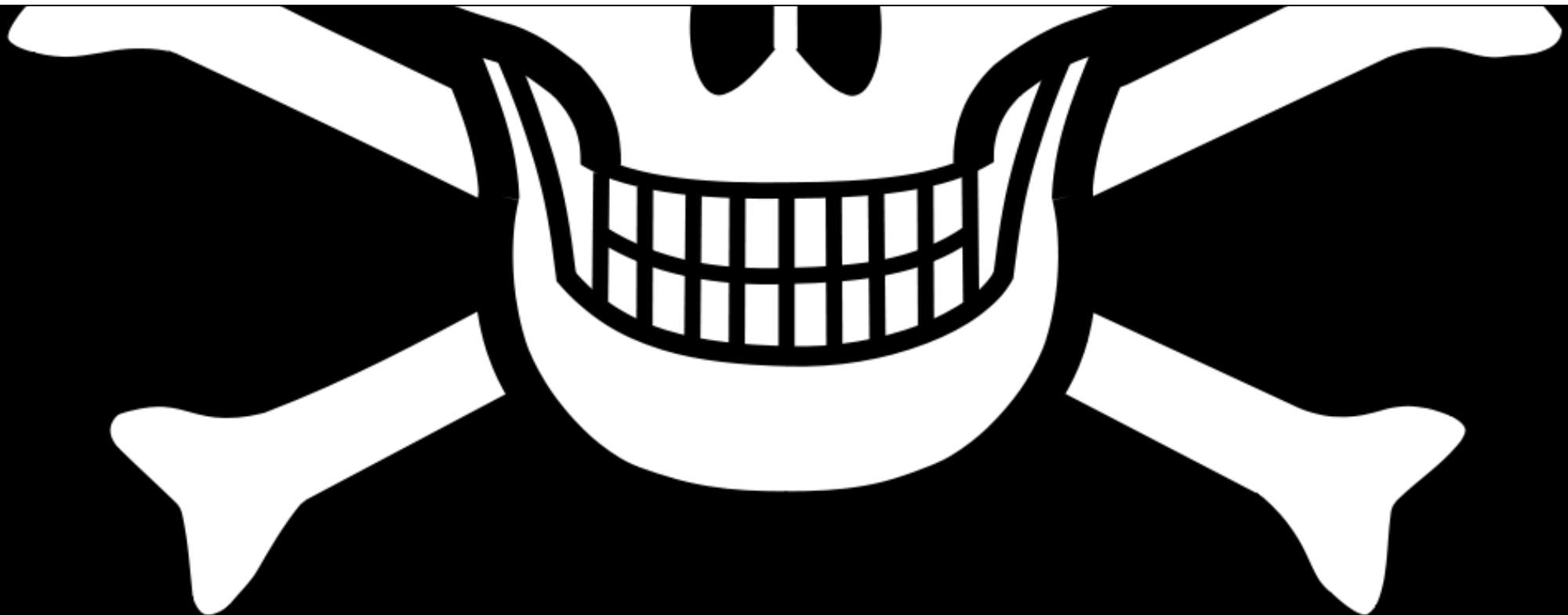


takeaway 2

explore all VR platforms



know thy enemies





enemy #1

sickness



enemy #2

performance



Temperature

enemy #3

overheating

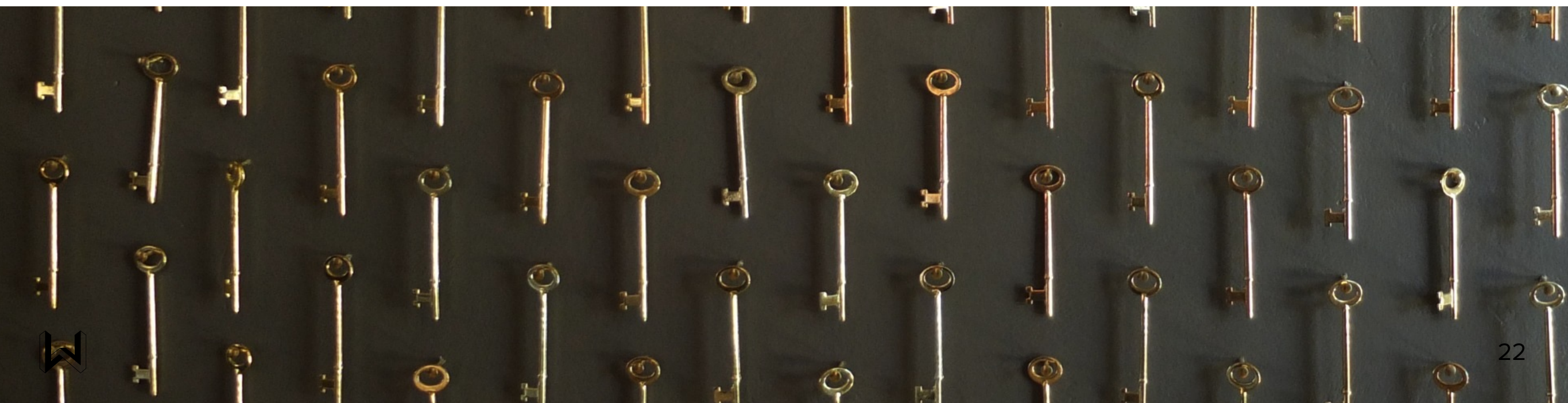


iPad needs to cool down
before you can use it.

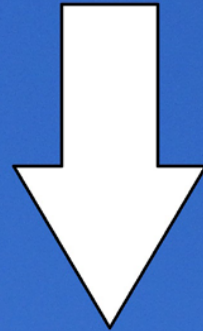


key takeaways

60FPS - optimization - presence - VR as an app



60 fps



best practices : 60 FPS





takeaway 3

stylized aesthetic





Blueskin
Level 13 Druid
Ironforge

Ahac
Level 60 Warlock
Ironforge

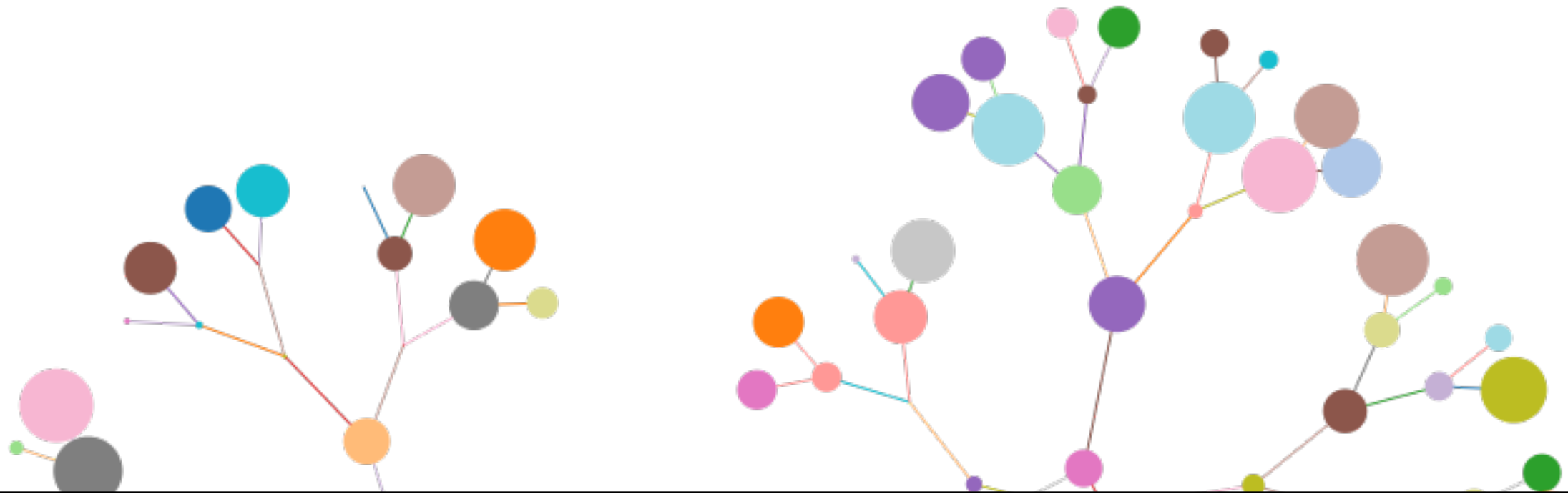
takeaway 4

don't render user avatar (?)



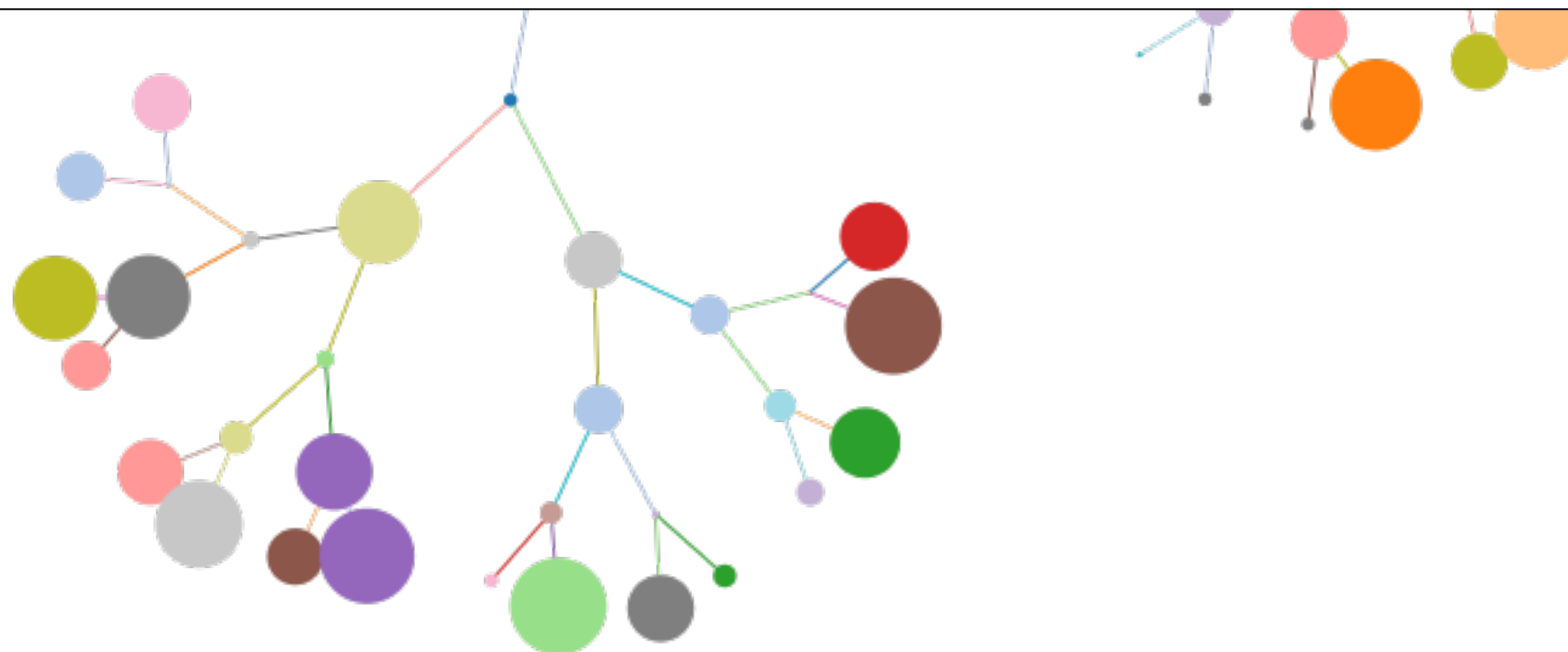
Ahac

Create New Character



takeaway 5

build discrete pockets of content

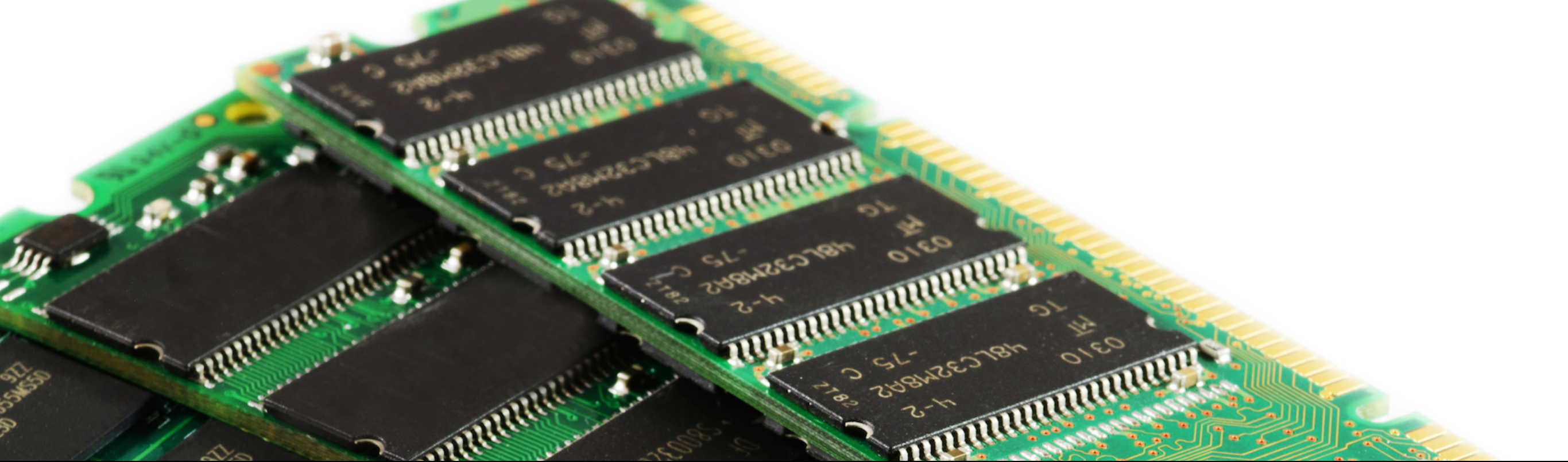




takeaway 6

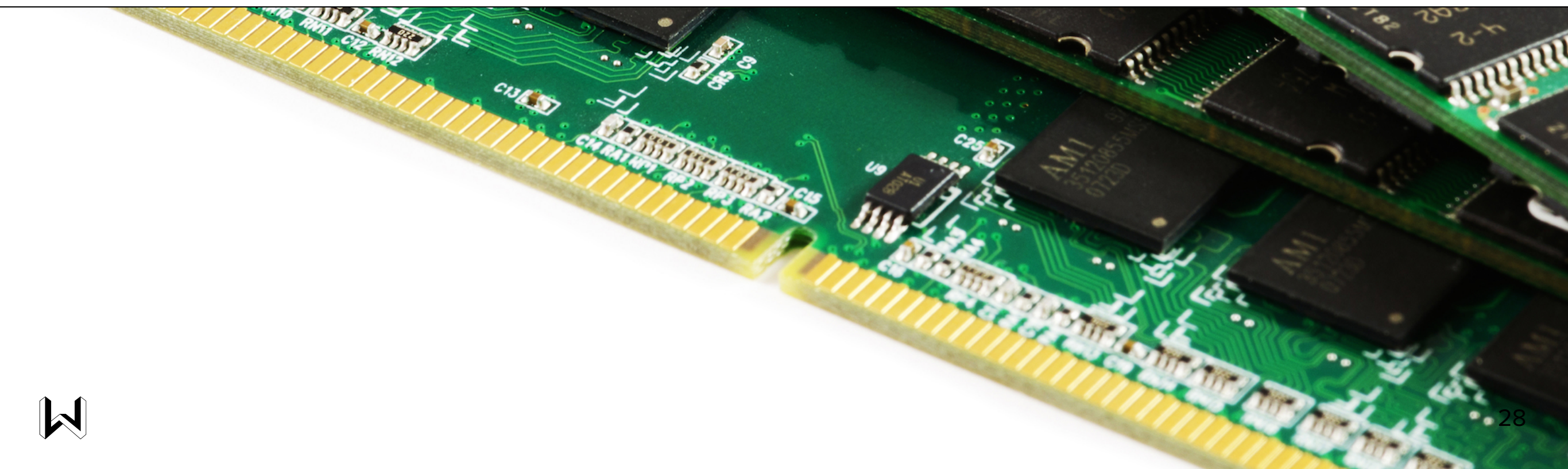
50k triangles per eye & < 100 draw calls





takeaway 7

200mb memory footprint



File Edit View Tools Window Help

New project Open project Save project Add sprites Remove sprites Add smart folder Publish sprite sheet

Settings

Data show advanced

Data Format Unity® - JSON data (.txt)

Data file s:/Resources/icebergAtlasData.txt

Texture show advanced

Texture format PNG (.png)

Texture file Prefabs/Atlas/icebergAtlas.png

Png Opt Level 0



takeaway 8

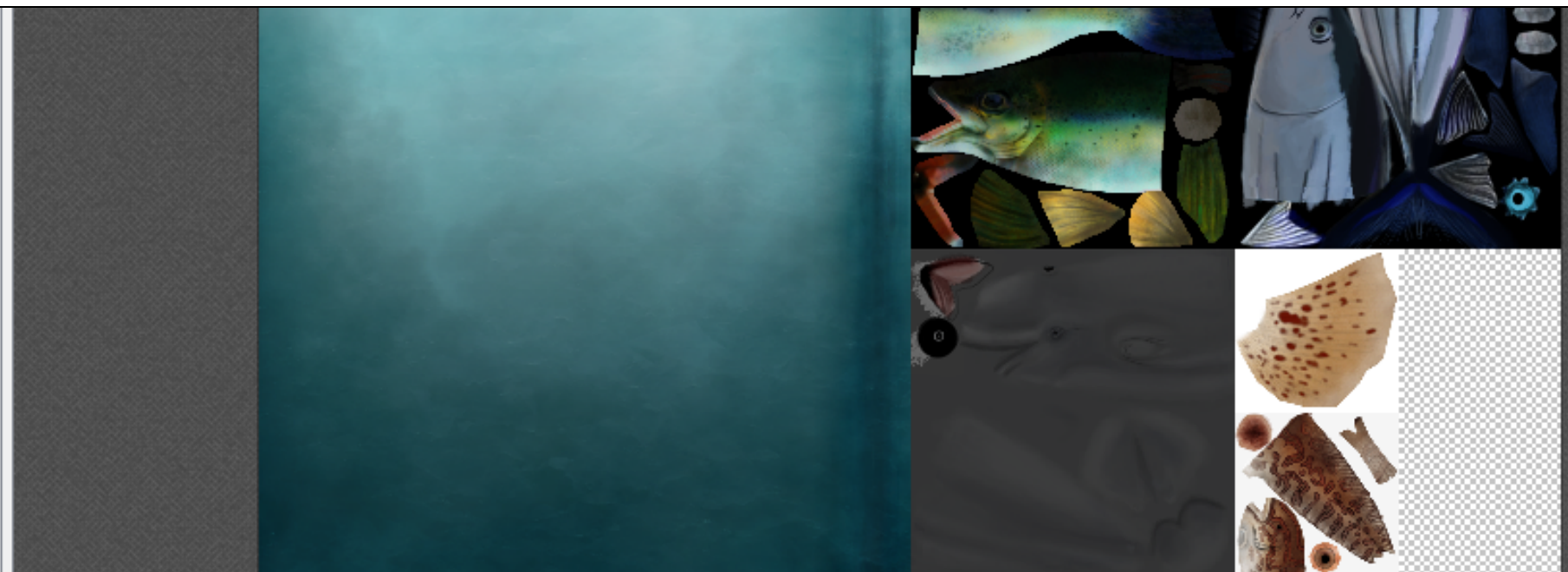
love your texture atlases

Algorithm MaxRects

Multipack ☐

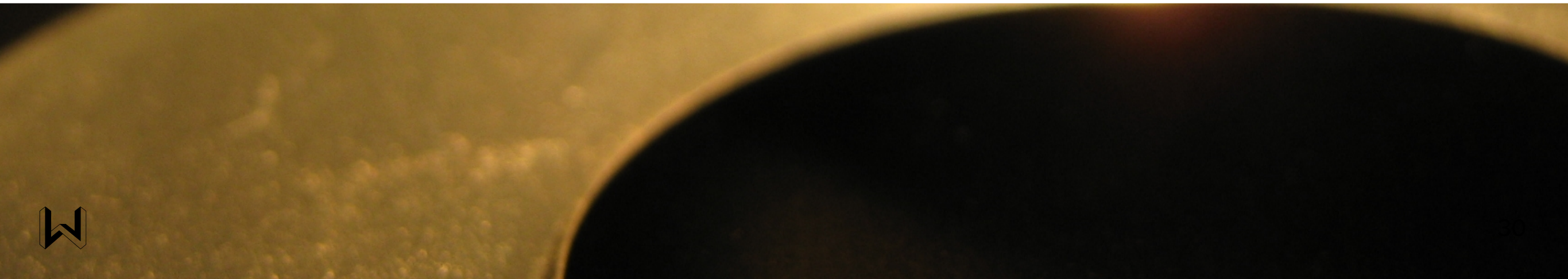
Sprites show advanced

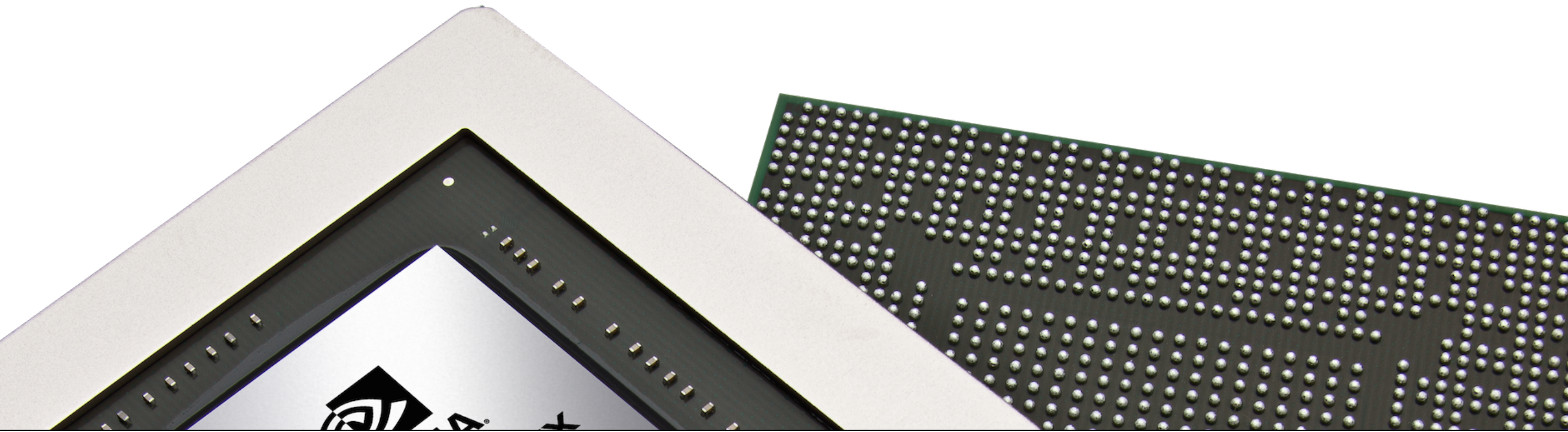
Trim mode None

Reduce border artifacts ☐ ⓘ



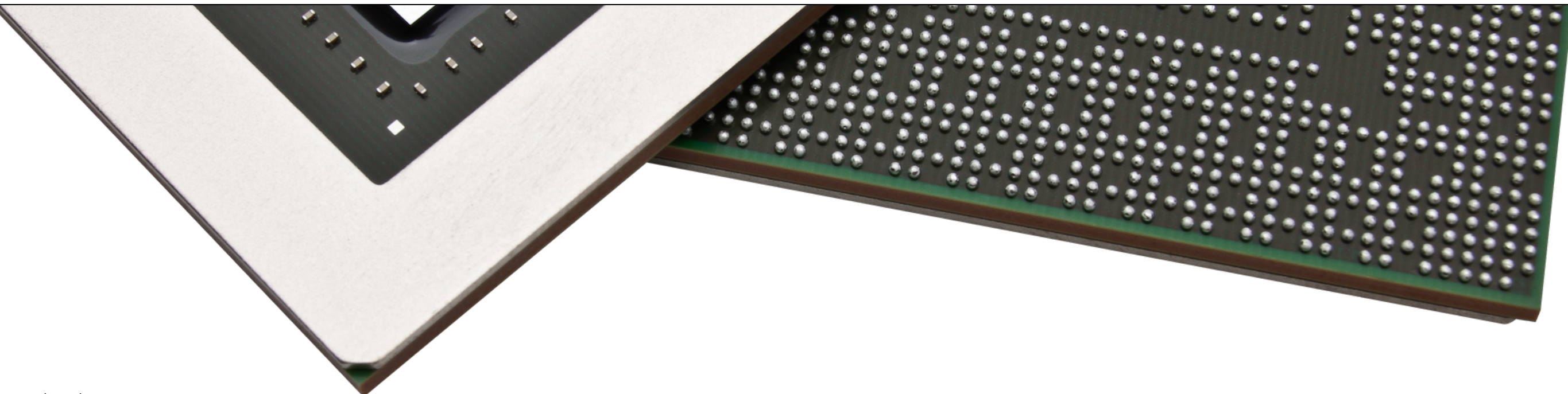
optimization





takeaway 9

optimize GPU then CPU





takeaway 10

minimize transparency





takeaway 11

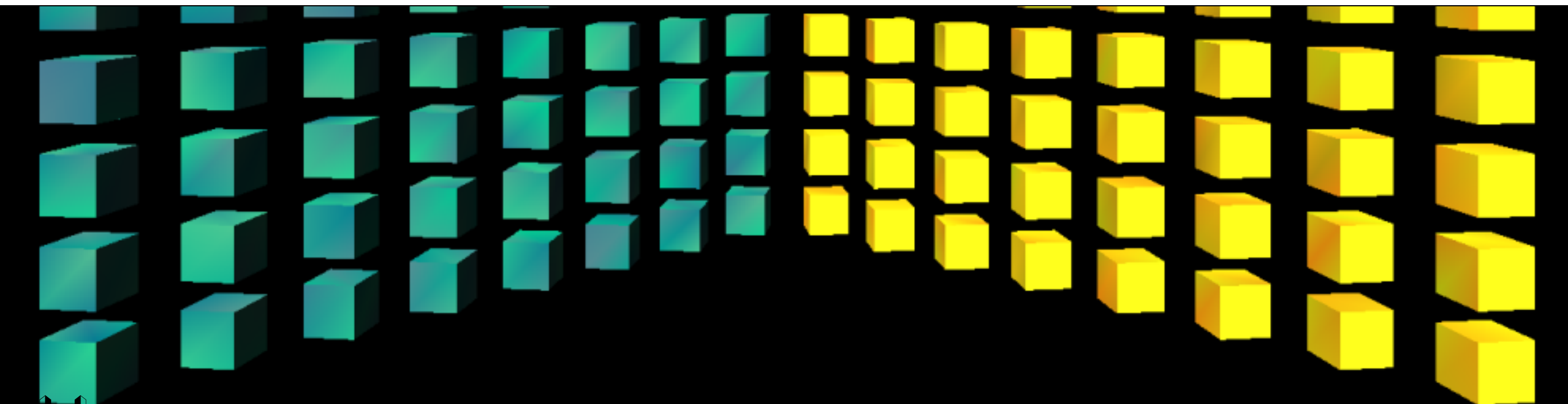
build mobile-specific debug tool





takeaway 12

shader optimizations++





takeaway 13

no post-processing FX



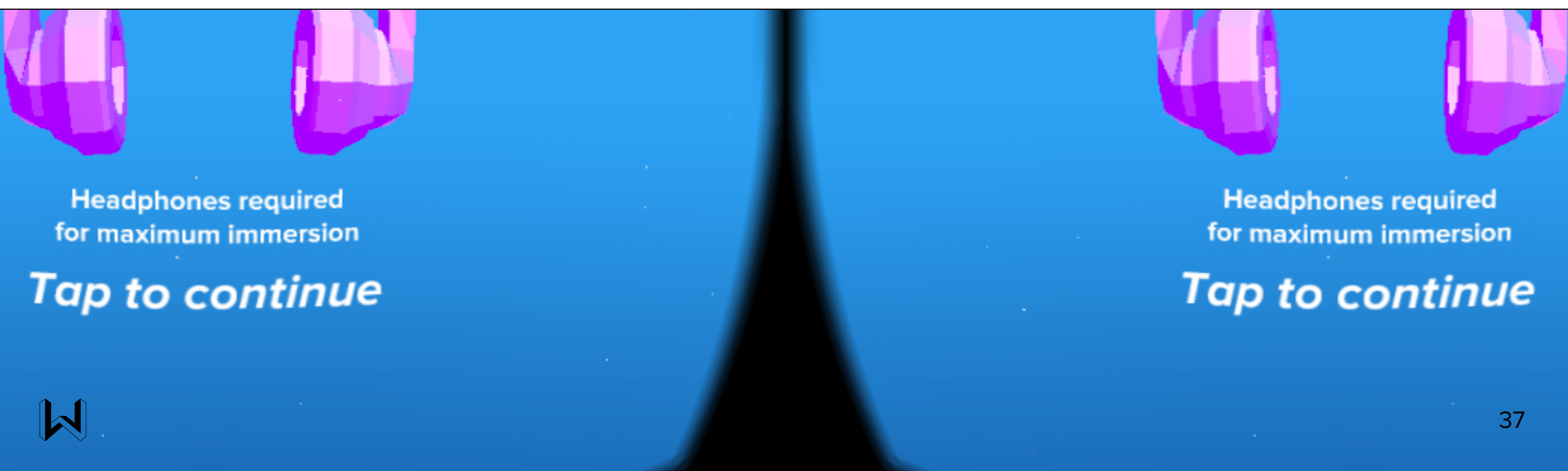
presence



The logo for 'thebluVR' is displayed on the left side of the top blue banner. It features a stylized blue and white circular icon to the left of the text 'thebluVR' in a bold, white, sans-serif font.The logo for 'thebluVR' is displayed on the right side of the top blue banner. It features a stylized blue and white circular icon to the left of the text 'thebluVR' in a bold, white, sans-serif font.

takeaway 14

headphones are a must

A background image of a VR headset with blue lenses and a black strap. The text 'Headphones required for maximum immersion' and 'Tap to continue' is overlaid on the lower half of the image.

Headphones required
for maximum immersion

Tap to continue

Headphones required
for maximum immersion

Tap to continue



takeaway 15

3D audio required : binaural not ready



takeaway 16

< 10 3D audio sources per scene



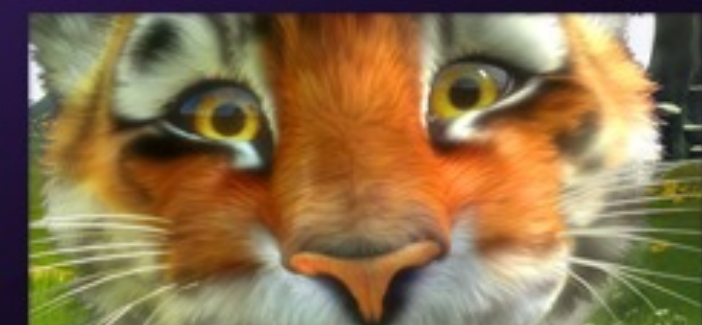


takeaway 17

tuning 3D audio sources takes time

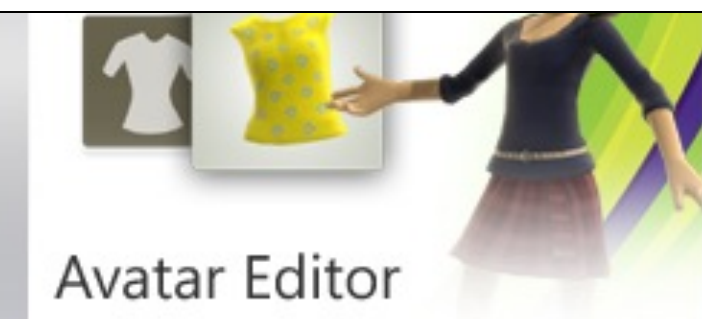


Kinect Hub



takeaway 18

build no-touch controls

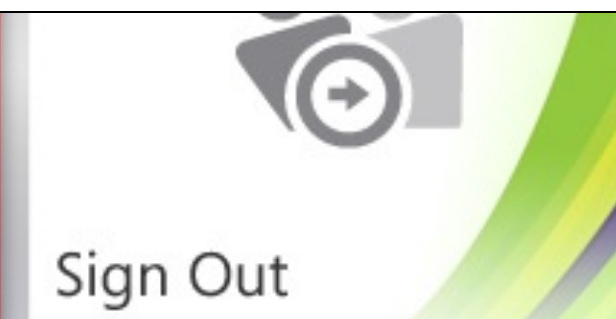


Avatar Editor



Friends

5



Tip: Wave for Kinect

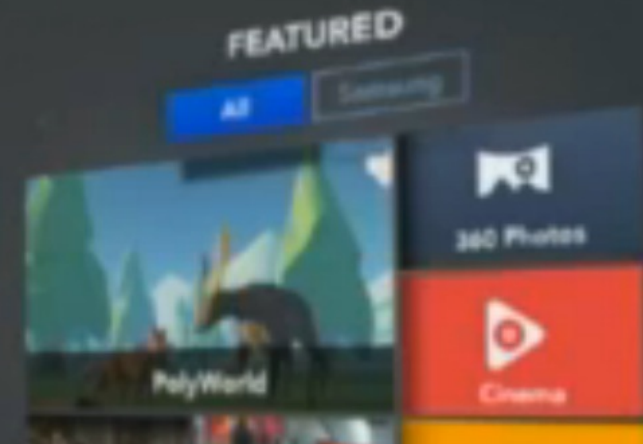
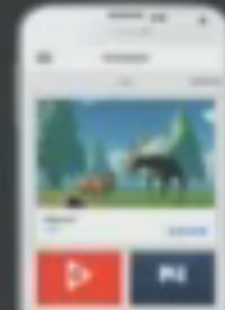
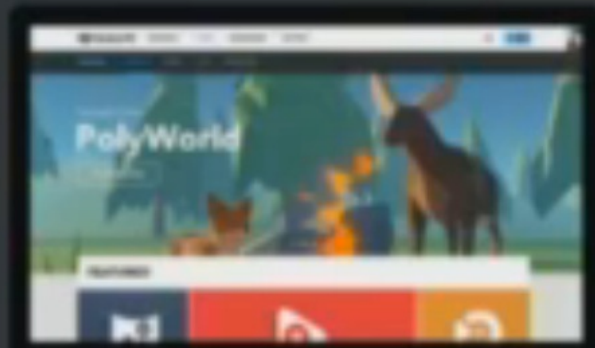
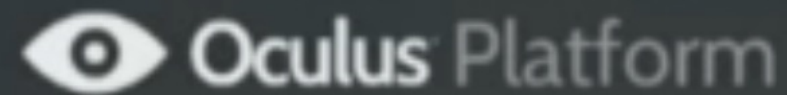




takeaway 19

design for couches





VR + mobile app





takeaway 20

build modular experiences





takeaway 21
don't forget about metrics





review



mobile vr dev checklist

1. little is set in stone
2. explore all VR platforms
3. use a stylized aesthetic
4. don't render user avatar (?)
5. design for pockets of interaction/content
6. limit poly count to 50k per eye
7. stay within 200mb memory footprint & < 100 draw calls
8. love your texture atlases
9. optimize gpu then cpu
10. minimize transparency
11. build mobile-specific debug tool
12. shader optimizations FTW
13. no post-processing FX
14. headphones are a must
15. 3D audio required : binaural not ready
16. use < 10 3D audio sources per scene
17. tuning 3D audio sources takes time
18. build no-touch controls
19. design for couches
20. build modular experiences
21. don't forget about metrics

WemoLab is hiring VR devs!



Thank You!

Benjamin Nourse Miller
Lead Experience Designer
WemoLab
@noursemiller

ben@wemolab.com



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recommended VR

- Kite & Lightning - DK2 - linear storytelling
- Don't let go - DK2 - potential of presence
- Sleepy hollow - DK1 - integration of VR & video
- The Chair - DK2 - early gaze-tracking potentiality
- Spotlight stories (windy day) - Cardboard - lightweight storytelling
- Felix & Paul videos - top-tier VR video content
- Omega Agent - Gear VR - great style
- Darknet - Gear VR & DK2 - aesthetic and feel
- Time Rifters - DK2 - FPS with unique twist
- harmonix Music VR - Gear VR - gaze tracking and casual play